In Labeling Single Neuron From Drosophila Brainbow: A High-throughput Image Processing Pipeline

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***Abstract*— Brainbow technique opens great opportunity to investigate brain connectome and neuron morphology by simultaneously, randomly, and sparsely labeling multiple neurons with different colors. After image acquisition, the first step to analyze such data is to separate neurons into single ones based on the color and spatial information. Facing such demand, we developed a high-throughput pipeline based on Vaa3D platform. The pipeline includes 1) an automatic color separation program to separate single neurons; 2) a high-throughput proof-reading program to visually inspect separation results and record the correctly separated neurons. Based on the pipeline proposed, we successfully separated and proof-read 17037 single neurons from 3630 drosophila brainbow images in less than two weeks which have been applied in the bench testing of BigNeuron project.**

***Index Terms*— color separation, brainbow, drosophila neuron labeling, Vaa3D**